

1. A defect detection system for use in an image processing system wherein the suitability of a film for processing is determined prior to scanning comprising:

5 a microprocessor connected to the sensor that determines the amount and extent
of imperfections on the film based on one or more reference sensor readings.

3. The defect detection system as recited in claim 1, further comprising an output device to report the amount and extent of imperfections on the film.

5. The defect detection system as recited in claim 1, wherein the sensor is a reflective sensor.

6. The defect detection system as recited in claim 1, wherein the sensor detects light transmitted through the film.

7. The defect detection system as recited in claim 1, further comprising a tape dispenser positioned to repair the film if the imperfection detected by the sensor is a breakage in the film.

8. The defect detection system as recited in claim 1, wherein the sensor detects the abnormalities in the shape of the perforations on the film.

9. The defect detection system as recited in claim 1, wherein the sensor detects moisture on the film.

10. The defect detection system as recited in claim 1, wherein the sensor detects oil on the film.

11. The defect detection system as recited in claim 1, wherein the sensor detects the moisture level of the film and if the moisture level is above a predetermined acceptable moisture level the film is dried until the moisture level drops below the predetermined acceptable moisture level.

12. The defect detection system as recited in claim 1, wherein the sensor detects foreign objects on the film.

13. The defect detection system as recited in claim 1, wherein the sensor detects foreign objects on the film and if the amount of foreign objects on the film is above a

predetermined acceptable foreign object level the film is cleaned until the foreign object level drops below the predetermined acceptable foreign object level.

14. A defect detection system for use in image processing comprising:

a roller for feeding a film into a sensor;

a reflective sensor for detecting imperfections on a film;

a microprocessor connected to the sensor that determines the amount and extent

5 of imperfections on the film and compares them to reference sensor readings; and

a router for separating film that is suitable for film processing from film that is not suitable for film processing based on the comparison of actual sensor readings to reference sensor readings by the microprocessor.

15. The defect detection system as recited in claim 14, further comprising an output device to report the amount and extent of imperfections on the film.

16. The defect detection system as recited in claim 14, further comprising a reference sensor and a memory, wherein the reference sensor readings are determined by the reference sensor and stored in the memory.

17. The defect detection system as recited in claim 14, further comprising a tape dispenser positioned to repair the film if the imperfection detected by the sensor is a breakage in the film.

19. The defect detection system as recited in claim 14, wherein the sensor detects the moisture level of the film and if the moisture level is above a predetermined acceptable moisture level the film is dried until the moisture level drops below the predetermined acceptable moisture level.

21. The defect detection system as recited in claim 14, wherein the sensor detects foreign objects on the film and if the amount of foreign objects on the film is above a predetermined acceptable foreign object level the film is cleaned until the foreign object level drops below the predetermined acceptable foreign object level.

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- exposing a film to one or more light sources;
- detecting the light reflected from the film to measure imperfections on the film;
- determining if the imperfections on the film exceed levels deemed detrimental to digital film processing; and

routing the film based on the sensor output depending on whether the film is suitable for digital film processing from film that is not suitable for digital film processing.

23. The method as recited in claim 22, further comprising the step of correcting the imperfection on the film by selecting a remedial measure that corrects the imperfection.

24. The method as recited in claim 23, wherein the remedial measure comprises the step of removing excessive moisture from the film.

25. The method as recited in claim 23, wherein the remedial measure comprises the step of removing foreign objects from the film.

26. The method as recited in claim 23, wherein the remedial measure comprises the step of repairing one or more broken sprocket holes are repaired prior to digital film processing.

27. The method as recited in claim 23, wherein the steps of exposing the film to one or more light sources, detecting the light reflected from the film to measure imperfections on the film, determining if the imperfections on the film exceed reference sensor readings, and correcting the imperfection on the film are repeated in an iterative manner.

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33. An imaging system comprising:

a defect detector comprising a defect sensor for detecting one or more imperfections on a photographic media, and a microprocessor connected to the defect sensor that determines the amount and extent of imperfections on the photographic media based on one or more reference sensor readings;

at least one light source operable to illuminate the photographic media; and
at least one image sensor operable to detect light from the photographic media.

34. An apparatus for cleaning film in a film processing system, comprising:

a particle removal member configured to remove particles from film;

a cleaning system automatically movable between a contacting position and a non-contacting position, wherein, in the contacting position, the cleaning system is configured to contact the particle removal member and remove particles therefrom, wherein the cleaning system is configured to automatically move from the non-contacting position to the contacting position at a predetermined time.

35. The apparatus as recited in claim 34, wherein the particle removal member comprises a particle removal roller adapted to rotate as film is moved past the roller.

36. The apparatus as recited in claim 34, wherein the particle removal member comprises an adhesive surface adapted for removing particles from the film as the film is moved past the member.

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38. The apparatus as recited in claim 34, wherein the cleaning system comprises:
a cleaning member movable between the contacting position and the non-
contacting position; and

5 a controller configured to cause the cleaning member to move between the
contacting position and the non-contacting position at the predetermined time.

39. The apparatus as recited in claim 34, wherein the particle removal member
comprises a roller and the predetermined time comprises a predetermined number of
rotations of the roller.

40. An apparatus for cleaning film in a film processing system, comprising:
a film transport system for moving film through a predetermined path;
a particle removal member configured to contact film and remove particles from
the film as the film is moved through the predetermined path; and

5 a cleaning system configured to remove particles from the particle removal
member, the cleaning system and the particle removal member being relatively movable
so as to be selectively contactable with respect to each other, the cleaning system having
a particle attraction surface operative to remove particles from the particle removal
member when the cleaning system is in contact with the particle removal member.

41. The apparatus as recited in claim 40, wherein the cleaning system comprises:
a disposable adhesive tape having the particle attraction surface; and
a cleaning member in contact with the tape.

- | Parameter | Unit | Value |
|-----------------------|------|--|
| Initial concentration | mg/L | 100 |
| Initial pH | | 7.0 |
| Temperature | °C | 25 |
| Time | h | 0, 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 65536, 131072, 262144, 524288, 1048576, 2097152, 4194304, 8388608, 16777216, 33554432, 67108864, 134217728, 268435456, 536870912, 1073741824, 2147483648, 4294967296, 8589934592, 17179869184, 34359738368, 68719476736, 137438953472, 274877906944, 549755813888, 1099511627776, 2199023255552, 4398046511104, 8796093022208, 17592186044416, 35184372088832, 70368744177664, 140737488355328, 281474976710656, 562949953421312, 1125899906842624, 2251799813685248, 4503599627370496, 9007199254740992, 18014398509481984, 36028797018963968, 72057594037927936, 144115188075855872, 288230376151711744, 576460752303423488, 1152921504606846976, 2305843009213693952, 4611686018427387904, 9223372036854775808, 18446744073709551616, 36893488147419103232, 73786976294838206464, 147573952589676412928, 295147905179352825856, 590295810358705651712, 1180591620717411303424, 2361183241434822606848, 4722366482869645213696, 9444732965739290427392, 18889465931478580854784, 37778931862957161709568, 75557863725914323419136, 151115727451828646838272, 302231454903657293676544, 604462909807314587353088, 1208925819614629174706176, 2417851639229258349412352, 4835703278458516698824704, 9671406556917033397649408, 19342813113834066795298816, 38685626227668133590597632, 77371252455336267181195264, 154742504910672534362390528, 309485009821345068724781056, 618970019642690137449562112, 1237940039285380274899124224, 2475880078570760549798248448, 4951760157141521099596496896, 9903520314283042199192993792, 19807040628566084398385987584, 39614081257132168796771975168, 79228162514264337593543950336, 158456325028528675187087900672, 316912650057057350374175801344, 633825300114114700748351602688, 1267650600228229401496703205376, 2535301200456458802993406410752, 5070602400912917605986812821504, 10141204801825835211973625643008, 20282409603651670423947251286016, 40564819207303340847894502572032, 81129638414606681695789005144064, 162259276829213363391578010288128, 324518553658426726783156020576256, 649037107316853453566312041152512, 1298074214633706907132624082305024, 2596148429267413814265248164610048, 5192296858534827628530496329220096, 10384593717069655257060992658440192, 20769187434139310514121985316880384, 41538374868278621028243970633760768, 83076749736557242056487941267521536, 166153499473114484112975882535043072, 332306998946228968225951765070086144, 664613997892457936451903530140172288, 1329227995784915872903807060280344576, 2658455991569831745807614120560689152, 5316911983139663491615228241121378304, 10633823966279326983230456482242756608, 21267647932558653966460912964485513216, 42535295865117307932921825928971026432, 85070591730234615865843651857942052864, 170141183460469231731687303715884105728, 340282366920938463463374607431768211456, 680564733841876926926749214863536422912, 1361129467683753853853498429727072845824, 2722258935367507707706996859454145691648, 5444517870735015415413993718908291383296, 10889035741470030830827987437816582766592, 21778071482940061661655974875633165533184, 43556142965880123323311949751266331066368, 87112285931760246646623899502532662132736, 174224571863520493293247799005065324265472, 348449143727040986586495598010130648530944, 696898287454081973172991196020261297061888, 1393796574908163946345982392040522594123776, 2787593149816327892691964784081045188247552, 5575186299632655785383929568162090376495104, 11150372599265311570767859136324180752990208, 22300745198530623141535718272648361505980416, 44601490397061246283071436545296723011960832, 89202980794122492566142873090593446023921664, 178405961588244985132285746181186892047843328, 356811923176489970264571492362373784095686656, 713623846352979940529142984724747568191373312, 1427247692705959881058285969449495136382746624, 2854495385411919762116571938898990272765493248, 5708990770823839524233143877797980545530986496, 11417981541647679048466287755595961091061972992, 228359 |

a cleaning system comprising:

a disposable adhesive tape;

5 a cleaning member in contact with the tape and movable between a contacting position and a non-contacting position, wherein, in the contacting position, the cleaning member is configured to place the tape in contact with the particle removal member such that the tape removes particles therefrom; and
a tape transport system for movement of the tape across the cleaning
10 member.

48. The apparatus as recited in claim 47, wherein the cleaning member comprises a contact roller and the particle removal member comprises a particle take-off roller.

49. The apparatus as recited in claim 47, wherein the cleaning system further comprises:

a controller configured to cause the cleaning member to move between the contacting position and the non-contacting position at predetermined times.